

set in unregulated competitive markets. Kahn and Shew demonstrate this fallacy in the context of a LEC that offers various sophisticated services in addition to ordinary voice telephony.

The first question is *whether those investments are economically efficient*, minimizing the combined costs of access, calling, and the newer services; and in this assessment it is necessary to take into account the sufficiency of the incremental net revenues flowing from the services the investments make it possible to offer. If the expenditures are efficient -- that is, if they conduce to the efficient design of the entire system -- then the marginal costs of the several services at which their prices should be set are their marginal costs under that system. Specifically, if the efficient system entails a higher proportion of NTS subscriber plant costs than some other design, the economically first-best flat rates to POTS customers will reflect those higher costs: The marginal costs of access *are what they are* in the system that is optimally designed to satisfy *all* the demands it serves.¹⁹

In economic theory, the incremental costs that video programming customers should face are the costs caused by their actions in the joint-use broadband network, not the costs allegedly incurred by the LEC's intention to enter the video transport business by constructing a broadband network. Economic costs and efficient prices of telephone services in an integrated network must reflect the causation of cost in that network and not in a hypothetical network designed exclusively for telephone customers.

16. The second flaw in the NCTA's analysis is that its stand alone cost test measures incremental cost incorrectly, in a way that eliminates much of the benefit of the construction of the joint-use network for current regulated services. Dr. Johnson's hypothetical stand alone cost study measures the incremental cost of video services as the difference between the incremental cost of a new integrated broadband network and the incremental cost of a new stand alone telephone network using a digital loop carrier system. This method calculates the incremental cost of video services²⁰ when society starts from a blank slate, choosing whether to build a joint-use video and telephone network or a stand alone telephone network. That is not

¹⁹ *Id.*, at 228, emphasis in original.

²⁰ This assumes the network only offers video and telephony services and does not take into account other services that use the integrated network. As the Commission noted before, this is an incorrect assumption.

the choice in question, however, and costs calculated from this hypothetical choice are not the costs that determine whether video service receives a subsidy. The relevant choice is whether the existing copper network should be replaced by a joint-use network, and the capitalized value of the investment that will provide cost savings from reduced maintenance and operating expenses in that network—as well as improvements to the telephone services—is a benefit to current telephone subscribers. In the subsidy calculation, the incremental cost of video services cannot include this component of the incremental cost of the integrated network, and in Dr. Johnson's calculation, such cost savings are ignored. Thus the blank slate stand alone cost test requires that LEC video customers pay for operating cost reductions and service improvements supplied to telephone services.

17. Dr. Johnson purports to use Bell Atlantic and Pacific Bell data to show that “that an allocation of more than 50 percent of common costs to video would be warranted,” and that “it is easy to postulate circumstances under which even a 100 percent allocation to video would be insufficient to prevent cross-subsidization.”²¹ This result stems from his assumption that, in the absence of video services, telephone ratepayers would be served with identical telephone services to those in the integrated network at a cost given by the installation of a digital loop carrier system. In the real world, however, in the absence of the integrated network, telephone subscribers would be served by the current copper distribution system and would be paying prices unrelated to the costs of Dr. Johnson's hypothetical network. Installation of the integrated network will benefit telephone subscribers to the extent it supplies more reliable, higher quality services and reduces operation and maintenance costs for those services, and the incremental cost associated with those savings must be ascribed (on a cost-causal basis) to telephone service, not to video services.

18. The stand alone cost test raised in this proceeding has no basis in economics. Dr. Johnson's proposal presumes the firm to be rate-of-return regulated and to supply only two services—telephony and video programming—so that if telephony is priced above its stand-alone cost, video programming must necessarily be subsidized. The calculation ignores service

²¹ Johnson at 2 and 6.

improvements, revenue from new regulated services and cost savings to telephone customers. The proposed test is not valid or useful for determining incremental costs for nonregulated services or assigning fixed costs between regulated and nonregulated services.

B. AT&T's Method Allocates All Costs of the Dual-Purpose Loop Plant.

19. AT&T also posits a world with two services, video and telephony, and proposes a definition of the “shared” cost of dual-purpose loop plant along with an allocator to assign those shared costs to video and telephone services. The proposed allocator is unexceptionable, though arbitrary. However, the definition of “shared cost” is at odds with its usual economic meaning. In economics—in this context—shared costs are a component of the incremental cost of the joint-use network which cannot be causally associated with the provision of either telephone or video service separately. AT&T's definition of shared costs—the difference between the cost of the joint-use loop plant and the sum of the incremental costs of the individual services—differs from this usage.

20. More importantly, AT&T's method is merely a diversion to disguise what is nothing more than a fixed allocation of the entire cost of the dual-use network. Simple algebra shows that the cost assigned to telephony is not at all the direct cost of telephony plus an allocation of shared costs but rather an arbitrary assignment of the entire cost of the dual-use network to telephony and video. Denote the cost of the joint-use loop plant by C_J , while the incremental costs of telephone in a video network and video in a telephone network are C_T and C_V , respectively. Then using AT&T's algorithm, the loop plant cost assigned to telephone service is given by

$$C(\text{TEL}) = C_T + \frac{C_T}{(C_T + C_V)} \times [C_J - (C_T + C_V)]$$

That is, the cost assigned to telephone is its incremental cost in a video network plus a fixed proportion of the shared costs. Simplifying,

$$C(\text{TEL}) = C_T + \frac{C_T C_J}{C_T + C_V} - \frac{C_T (C_T + C_V)}{C_T + C_V}$$

or

$$C(\text{TEL}) = C_J \times \frac{C_T}{C_T + C_V}$$

AT&T's method has nothing whatever to do with economic cost assignment, in which direct costs are assigned on a cost-causal basis and the remaining "shared costs" are assigned using a constant allocation factor. Instead, the AT&T method simply allocates all costs of the dual-use loop plant C_J to telephone and video services in direct proportion to the relative magnitudes of the telephone and video incremental costs.

21. AT&T claims that "the benefits of this approach are numerous:" listing the advantages of simplicity, uniformity of application across LECs and administrative manageability²² and that it should be applied to costs other than loop plant

(t)he shared costs of dual-purpose switching plant should be allocated using the same methodology as proposed for allocating the shared costs of dual-purpose loop plant. (AT&T at 9).

It also claims—without explanation—that "the allocation method...is an economically rational approach" to allocate a "reasonable portion of shared costs." (at 7).

22. AT&T is partly right. The method is manifestly simple, uniform and manageable—even more simple, uniform and manageable than AT&T acknowledges—since shared costs actually play no role whatever in the calculation. The problem, of course, is that the method is transparent nonsense: it does not allocate a reasonable portion of the shared costs of the loop—it allocates all costs, shared and direct—and for that reason has no claim to economic rationality. The method violates both the economic principles of cost causation as well as the FCC's rules that direct

incumbent local exchange carriers to allocate the costs in these accounts between regulated and nonregulated activities pursuant to a hierarchy of cost apportionment methods that emphasizes direct assignment and the use of cost-causative allocation methods ... [and that] whenever possible, costs in each Part

²² AT&T Comments at 6.

32 account are to be directly assigned to either regulated or nonregulated activities.²³

The direct costs of video distribution services or telephone services will differ in broadband networks that use different technologies or serve different population densities or geographic areas. Economic rationality requires—at least—that the different direct costs of video and telephone be reflected in different cost assignments. AT&T's method ignores cost causation entirely and assigns identical shares of costs to video and telephone services across these different networks. Adoption of AT&T's method would be a step backward, leading to cost assignments that were entirely arbitrary, rather than ones that add an arbitrary assignment of fixed costs to direct costs that are caused by the supply of the service in question.

C. The construction of joint-use facilities for regulated and nonregulated services does not constitute an exogenous event under the FCC's price cap plan.

23. Several parties contend that the FCC should require exogenous cost changes which would reduce the PCIs governing interstate services regulated by price caps.²⁴ Such a requirement would be a serious error. First, the FCC's rules themselves demonstrate that exogenous cost treatment in the case of regulated and nonregulated costs is only considered an issue when costs are removed from regulated costs and reallocated to nonregulated costs. These exogenous cost provisions did not contemplate the deployment of a new network to provide both regulated and nonregulated services, where nonregulated costs were never before allocated to regulated costs. In the FCC's words,²⁵

We agree with those commentators that argue that exogenous cost treatment of *investment reallocated from regulated to nonregulated use* is necessary to give effect to the Joint Cost rules in a price cap environment...The rules are intended to protect ratepayer from the investment risk associated with a carrier's nonregulated businesses by excluding from that carrier's rate base both plant

²³ LEC Video Cost Allocation NPRM at ¶s 11-12.

²⁴ See, e.g., Comments of AT&T (at 10) and Cox Communications (at 11).

²⁵ Policy and Rules Concerning Rates for Dominant Carriers, Second Report and Order, CC Docket 87-313, 5 FCC Rcd 6786 (1990).

investment currently used for nonregulated purposes and spare capacity intended for future nonregulated use...

...However, under the price cap plan, reallocation of regulated investment to nonregulated activities would not impact interstate rates at all. To register the effect of this reallocation in a price cap context, and thus give effect to the Joint Cost rules, *we must require an exogenous cost adjustment to be made whenever regulated investment is reallocated to nonregulated activities.*²⁶

In reality, the costs associated with delivering nonregulated services over a joint-use network—which were never incurred as part of the regulated network—cannot be removed from regulated costs.

24. Second, the industry productivity factor used to calculate the PCI for each price cap regulated firm already captures the average annual reduction in unit costs realized by the LEC industry in the past and adjusted to be a reasonable target for the future. In setting that target, realized economies of scope in the network were taken into account, and to treat a future network efficiency stemming from some new economy of scope as an exogenous cost change would result in a double counting of network cost savings in the PCI.²⁷

V. CONCLUSIONS

25. The essential role of government intervention—or regulation—is to establish incentives for the regulated firm so that it will be led—following its own self-interest—to behave in the same manner as a firm in unregulated (competitive) markets. Price cap rules accomplish this. The state and federal cost allocation rules, including the FCC’s Part 64 requirements, provide rigorous safeguards against cross-subsidies (in addition to the protection embodied in price cap regulation), and stand-alone cost tests have no bearing on whether a single service is receiving a subsidy. Moreover, price cap regulation eliminates the possibilities of cross-subsidies, pure

²⁶ *Id.*, 6807, 6808 (footnotes omitted and emphasis added)

²⁷ This situation is similar to the one the FCC has already recognized: “...a general change in tax rates...will be reflected in the inflation factor used to adjust price caps annually. Exogenous treatment of a tax change would thus unfairly ‘double count’ its impact.” LEC Video Cost Allocation NPRM at ¶ 59.

price cap companies do not base their prices on cost allocations, and exogenous cost changes are not required—and they would distort the competitive process.

26. Arguments of LEC competitors seeking fixed allocation of costs to nonregulated services fail to recognize that allocation of common cost is unnecessary to protect against cross-subsidization. Arbitrary allocations justified by a policy of such protection are thus inherently unreasonable and run the risk of discouraging investment and competition in unregulated lines of business.

William E. Taylor

William E. Taylor

Subscribed and sworn to before me
this 11th day of June 1996.

Gene S. Demaree

Notary Public

My Commission Expires July 7 2002

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)	
)	
The Bell Atlantic Telephone)	Transmittal No. 741
Companies)	
Tariff FCC No. 10)	
)	
Video Dialtone Service)	

Supplemental Affidavit of Dr. Charles L. Jackson

I, Charles L. Jackson, being duly sworn, depose and say:

1. My name is Charles L. Jackson. My business address is Strategic Policy Research, Inc., 7500 Old Georgetown Road, Bethesda, Maryland. I am a Principal at Strategic Policy Research, Inc. I filed an affidavit previously in this matter on March 6, 1995. A description of my qualifications and a copy of my professional biography was included in the March 6 affidavit.
2. The purpose of this statement is to respond to comments made by the cable industry in this proceeding and specifically in the supporting declaration of Dr. Leland Johnson, dated November 30, 1995. In the paragraphs below, I first review my earlier filing in this proceeding. I then examine Dr. Johnson's observations on the technology employed in Dover and show that they do not properly describe the capabilities of the Dover VDT network. Finally, I offer a few concluding comments.
3. A key purpose of my earlier affidavit was to offer my own analysis of the classification of investment in the Dover system among three categories (video, telephony, and shared) in order to assist the Commission in its evaluation of the cost allocation proposed by Bell Atlantic. In particular, a specific purpose of my earlier affidavit was to verify that Bell Atlantic had properly

identified the use of subassemblies and other system elements in allocating the cost of the VDT hardware. At no point in his declaration does Dr. Johnson dispute any of these identifications of use nor does he dispute any statement about the function of any element of the system.

4. Placing the most favorable interpretation upon his analysis, Dr. Johnson appears to establish a false dichotomy between traditional telephony and video dialtone service. He appears to believe that all services fall into one category or the other. The fact is that the Dover network will be able to provide a wide range of capabilities and options — not just (1) traditional telephony and (2) cable-like video services. Consider one example. It should be clear that the high-speed asymmetric digital service of the Dover system is excellent for browsing the Internet — people read fast and type slowly. As I mentioned in my earlier affidavit, the Dover architecture supports a much higher-speed downstream data connection than do services such as POTS or ISDN. While Dr. Johnson appears to see no market for such services, his clients do. Since last March, the cable industry has made much of the potential of providing similar high-speed Internet access over their facilities. Numerous stories in the trade press have trumpeted the value of cable's ability to provide high-speed Internet access using asymmetrical digital services. One such article quoted Steve Craddock of Comcast as saying, "This will be the largest revenue opportunity we've seen in a long time" and that reactions in the marketplace had been "incredibly high."¹ Another article quoted TCI chairman and cable industry leader John Malone: "[High-speed data] is a product that will be uniquely available from the cable industry. . . . The telephone industry is not capable of providing anything like this, and it will be many years before there is an alternative to us."² Dr. Malone is essentially correct. Traditional telephone systems, even with digital loop carrier to the neighborhood, the alternative promoted by Dr. Johnson, will provide poorer access to Internet services than will communications systems based upon modern high-speed technologies. Browsing still graphics is slower over narrowband connections than over high-speed connections such as those that will be available on the Dover system. Browsing audio clips and

¹ See, "High Speed Data a Priority," Fred Dawson, *CED*, June 1995, p. 127.

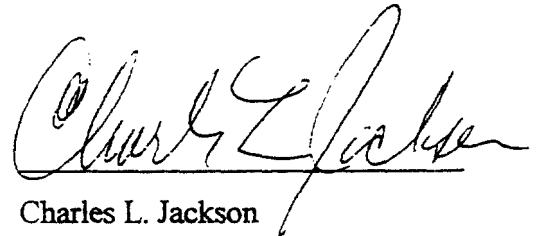
² "High-Speed Modems Take Center Stage," Leslie Ellis, *Multichannel News*, p. 108.

video is almost unacceptable over narrowband links because the more limited capacity of narrow-band facilities is insufficient to allow rapid picture changes. (For an interesting example of how video on the Internet can expand horizons, see <http://pswac.ntia.doc.gov> which contains, among other items, Chairman Hundt's speech at the first meeting of the Public Safety Wireless Advisory Committee. The Internet makes the video images of this event, which was not covered by CSPAN or the Capitol Connection, available to anyone on the Internet.) As the quotations from Mr. Craddock and Dr. Malone show, despite Dr. Johnson's reservations about the new technologies, there is strong evidence that reasonable people believe that demand exists for these high-speed data services.

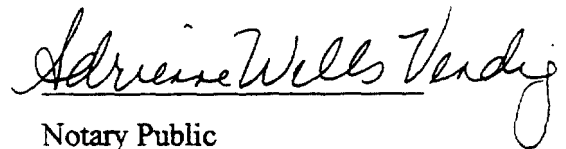
5. The high-speed digital capacity of the Dover system can be used to transport large digital objects, such as program files or still images downstream, with negligible delay. Thus, the Dover network could be used for distance learning or the distribution of medical images. The Dover network is particularly well suited for transmission of learning programming to the home-bound. The Dover network would also offer excellent support for the diskless network access station that is the subject of much current discussion and would be far superior to either POTS or ISDN for use in association with such user terminals. For example, down loading a one megabyte program (e.g., a typical word processing program or net viewer) would take four and a half minutes over a 28.8 K bit per second link (this data rate is about the maximum that is regularly achieved on dial-up voice lines) and would take two minutes over a ISDN basic rate connection (64 Kbps). In contrast, the same file load would take only a bit more than one second over one of the 6 Mbps channels of Dover system. The convenience of the high-speed option is overwhelmingly superior to that of the options using lower rate communications. One finds it hard to imagine using workstations that require more than four minutes to load software or load help files. Rather, consumers would continue to use disk-based workstations. To reiterate a point I made in my earlier affidavit, the benefits of a big digital pipe are enormous and cannot be determined in advance — no more than one can say what will be built with a two-by-four. They are each flexible building blocks with many uses.

6. Dover's network architecture offers additional advantages over party-line type architectures such as used in cable TV systems. It appears clear that the use of a star network architecture (fiber to the neighborhood, dedicated cables to the household) improves both privacy and reliability when compared to architectures that use broadband party lines to provide service to consumers. We have seen an exact technical parallel in the local area network (LAN) industry. The original Ethernet and many commercial implementations of ethernet technology used a shared broadband passive transmission medium (coaxial cable — the "ether" of ethernet) to carry the signals from all the computers connected to the LAN. This early technology (known as 10Base-2 and 10Base-5 depending upon the kind of coaxial cable used) has now been replaced in most applications with an improved technology that uses traditional telephone twisted pairs (10Base-T) and repeater hubs. One of the reasons for the move from shared coaxial media (party line) to dedicated twisted pair media (star network) was the improvement in reliability. When a connection fails on a communications system using a shared medium, it can deny communications to all units attached to the shared medium. In contrast, the failures on star networks are usually automatically isolated and easily diagnosed. The well known reliability problems of cable systems grow, in significant part, from their use of shared units in their traditional architectures. Indeed, one of the arguments the cable industry advances for deploying fiber deep into their networks is that running fiber close to the consumer reduces the number of customers affected by a failure of shared hardware, and thus increases the reliability seen by the average customer. Maintenance costs for systems with architectures like that of the Dover system will be lower than those costs for traditional telephone service architectures. A star architecture, which sends to each home only the signals intended for that home has an element of privacy which is lacking in systems with party-line architectures. While it is hard to put a dollar value on privacy, there is no dispute that many consumers value privacy substantially. The well-publicized interceptions of cellular telephone traffic illustrate the import of telephone security and the vulnerability of systems that make their signals available to all.

7. Relatedly, I would expect any new technology system to also support computerized service installation and maintenance tools which would lower costs. Modern digital technologies allow for automation of the testing and diagnosis process — at least in the portion of the network containing active electronics. Fiber can be expected to reduce provisioning and administrative costs. To conclude, the Dover VDT system will be able to support an array of new services and will provide a sound foundation for the future. Its fiber-to-the-curb architecture offers maintenance and provisioning savings over the current mode of operations and provides better reliability and security than alternative designs that use shared media.


Charles L. Jackson

Subscribed and sworn to before me this 20th day of December, 1995.


Notary Public

ADRIENNE WELLS VENDIG
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires September 20, 1998